Food Processing Studies

PROF. KEHINDE TAIWO
Department of Food Science And Technology
Obafemi Awolowo University, Ile-Ife
Food technologies and market analyses

– develop post-harvest methods for processing and preservation of vegetables using technologies that can be readily adopted by local farmers and end users

Nutritional security

Develop strong links between:

-- agriculture, food, nutrition and health

Prof. Kehinde Taiwo
Department of Food Science & Technology
Obafemi Awolowo University, Ile-Ife
Food Processing Studies

Traditional Leafy Vegetables
- rich in micronutrients

Highly Perishable

Preservation and Storage Methods → Prolonged Availability
Food Processing Studies

Traditional Leafy Vegetables - rich in micronutrients

Highly Perishable

Preservation and Storage Methods ➤ Prolonged Availability
Objectives

Remove components that:
- discourage consumption
- are anti-nutritional factors

Minimize nutrient losses

Employ village scale preservation technologies

The research challenge is that any food processing operation modifies nutrient composition
Bitter Leaf Samples Processed by Blanching

Bitter Leaf (*Vernonia amygdalina*)

Good source of various minerals, carotenoids and vitamins

Limited consumption due to bitter taste

Bitter Leaf

Sun-dried for 3 days
Bitter Leaf Samples Processed by Blanching

![Bar chart showing potassium content in mg/100g over time of treatment in minutes for water and saline solutions.](chart-image-url)
Bitter Leaf Samples Processed by Blanching

![Graph showing potassium content (mg/100g) over time of treatment (min) for water and saline samples.](image)
Ugu Leaf Samples Processed by Different Techniques

Ugu (Telfairia Occidentalis)

Leaves are rich source of antioxidants
Ugu Leaf Samples Processed by Different Techniques

Iron Content / mg 100g⁻¹

- Dried Leaves
- Boil 5 min water
- Boil 5 min saline
Ugu Leaf Samples Processed by Different Techniques

Squeeze Washing

Technique used to remove bitter compounds from bitter leaf

http://www.allnigerianrecipes.com/howto/dry-bitterleaf-fresh.html
Ugu Leaf Samples Processed by Different Techniques

Iron Content / mg 100g⁻¹

- Dried Leaves
- Boil 5 min water
- Boil 5 min saline
- Squeeze wash Water 5 min
- Squeeze wash Saline 5 min
But, what about the taste???
Bitter Leaf Samples Processed by Different Techniques

Total Tannins Content

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Tannin Content / mg g⁻¹ (extract)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>30</td>
</tr>
<tr>
<td>Water</td>
<td>20</td>
</tr>
<tr>
<td>Boiling (20 min)</td>
<td></td>
</tr>
<tr>
<td>Blanching (40 min)</td>
<td></td>
</tr>
<tr>
<td>Squeeze-Washing (10 min)</td>
<td></td>
</tr>
</tbody>
</table>
Bitter Leaf Samples Processed by Different Techniques
Total Tannins Content

- Boiling (20 min)
- Blanching (40 min)
- Squeeze-Washing (10 min)
Community Taste Panel Assessments
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Indigenous Leafy Vegetable Recipes

Developed in collaboration with Rachel Alao (Helping Hands Resource Centre For Immigrants)
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Hedonic Taste Panel Assessment score of 1-9 with:
1 do not like at all
9 like extremely
Community Taste Panel Assessments
## Community Taste Panel Assessments

<table>
<thead>
<tr>
<th>Vegetable Soup</th>
<th>Ugu dried</th>
<th>Ugu fresh</th>
<th>Igbagba dried</th>
<th>Igbagba fresh</th>
<th>Tete dried</th>
<th>Tete fresh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taste</td>
<td>5.6</td>
<td>6.6</td>
<td>6.1</td>
<td>7.3</td>
<td>7.2</td>
<td>7.9</td>
</tr>
<tr>
<td>Colour</td>
<td>5.3</td>
<td>6.1</td>
<td>6.4</td>
<td>7.2</td>
<td>7.0</td>
<td>7.5</td>
</tr>
<tr>
<td>Texture</td>
<td>4.6</td>
<td>6.4</td>
<td>5.5</td>
<td>6.8</td>
<td>6.5</td>
<td>7.6</td>
</tr>
<tr>
<td>General appearance</td>
<td>6.1</td>
<td>6.9</td>
<td>6.4</td>
<td>7.1</td>
<td>6.9</td>
<td>7.7</td>
</tr>
<tr>
<td>Overall acceptance</td>
<td>6.2</td>
<td>7.4</td>
<td>6.4</td>
<td>7.2</td>
<td>6.9</td>
<td>7.7</td>
</tr>
</tbody>
</table>
Conclusions

Blanching recommended for nutrient and mineral preservation

Squeeze washing achieved highest reduction in anti-nutritional contents in bitter leaf

Compromise required
  nutrient loss vs anti-nutrient reduction

Taste panels indicate
  UIV leafy vegetables acceptable ingredients
  Fresh UIV preferred

UIV cultivation will contribute to nutrient security in Nigeria